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# Galena Industries, Limited

cc: Bradley

July 16, 1986

Mr. Frank Hale
O'Brien & Gere Engineers & Consultants
1304 Buckley Road
Syracuse, N.Y. 13221

Subject: St. Louis Lead Recyclers, Inc.

Dear Sir:

This correspondence is a follow up to your telephone conversation with Mr. David M. Gubanc, P.E. during the week of June 23, 1986.

St. Louis Lead Recyclers, Inc., located adjacent to the Taracorp/NL Industries waste battery pile, is uniquely equipped to recover a significant portion of the commercial value in the waste pile in an environmentally safe manner. The facility has filed the necessary notifications and RCRA applications to qualify for interim status under the "New RCRA" Definition of Solid Waste. As you may recall, facilities in Illinois that reclaim spent lead acid batteries will require to hold RCRA permits and meet Interim Status Standards after July 2, 1986.

Attached for your review is a technical evaluation of the recycling equipment operated by St. Louis Lead Recyclers, Inc., performed by U.S. EPA's Emergency Response Team (ERT). Notice ERT's recommendation that this process be brought to the attention of responsible parties (PRP's) engaged in cleaning up lead acid battery piles.

St. Louis Battery Recyclers, Inc. is willing and able to operate the facility for the purpose of reducing the environmental risk presented by the Taracorp/NL Industries waste pile.

We look forward to a prompt response.

Sincerely,

Robert J. Crawford
General Manager

Attach/RJC/jmg
cc: Mr. Steve Holt, NL Industries, Inc.
Mr. Roger Grimes, Esq., U.S. EPA-Region V

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On June 29, 1983 Dr. Joseph LaFornera of the US EPA Environmental Response Team inspected the St. Louis Lead Recyclers operation and video-taped the process. Attached is his report.


# Evaluation of Cal West Metals Battery Waste Reclaiming System

Background

On April 6, 1983, ERT received an information package on the Cal West Metals Battery Waste Reclaiming System. The package was referred for evaluation to ERT by Mr. William N. Hedeman, Jr. in response to a request by Congressman Jack Kemp who considers the system a candidate for use in cleaning up the lead pollution emanating from the piles of recycled lead storage batteries at battery recycling plants. These plants are located at various places around the United States. The locations of some of the largest and the estimated tonnage of their waste piles are documented in Table 1.

These are primarily operations that cut open automobile and truck batteries and removed the metallic lead cells. The lead was then melted down, re-refined and recycled. The by-product of this operation, the lead oxide, lead sulfate, and battery acid was typically "thrown out the back door" and piled up. The red lead oxide (about 30% by weight of the pile) dries out and slowly blows into the air as dust, contaminating nearby areas. In many of the locations, residents of the neighboring areas have shown significantly elevated blood-lead levels, which may result in anemia, psyco-neurological dysfunction (mental retardation), kidney disorders, and reproductive system impairment (increased risk of miscarriage, stillbirth, or premature delivery.)

Table 1 lists and Figure 1 show only some of the very large operations. It is probable that many local junk yards, local metal recycling operations, and abandoned hazardous waste disposal sites have used similar lead recovery techniques and have smaller piles of lead oxide/sulfate-contaminated battery carcasses.

Until very recently, these waste piles have not been reclaimable and for the most part have been left to slowly blow away with the wind and leach into groundwater. In some cases, the reclaimers have covered the piles with "clean" dirt, but this action does little or nothing to prevent the leaching of lead by rainwater (often acidic) and the attendant contamiantion of groundwater and/or surface water runoff.

Options for effectively dealing with the air and water pollution problems have been limited to excavation and transport for burial at an approved site, installing an impervious cover (clay, concrete, or asphalt cap) over the site, or complete immobilization of the entire pile. These options are inordinately expensive and as such it has been felt that there was no cost-effective solution to the problem.

The Cal West Metals System, however, introduces a fourth option - on-site treatment which appears to be cost-effective in comparison with the other methods (depending on the lead market it may even turn a profit), and has the added benefit of reducing to nearly zero the volume and weight of hazardous waste by recycling almost the entire pile into useable products. The following is a description of the system and an evaluation of its applicability to solving the waste battery pile problem at uncontrolled hazardous waste sites based on a site visit to St. Louis Lead Company in Granite City, IL where one of the systems has been installed.

## System Description

The Cal West Metals Waste Battery Reclaiming System* is a process of separating the materials previously recycled batteries into specific classes: metallic lead, lead oxide/sulfate, plastic, and hard rubber. The metallic lead is melted down and sold as crude lead; the lead oxide/sulfate is sold to smelters for its high lead content (60%); the plastic case material can be recycled to a plastics fabricator; and the hard rubber case material can be washed and used as a fuel supplement in a coal-fired boiler or power plant.

The separation is effected as follows: After excavation of a truckload from the pile under stringent dust control measures, the bulk material is loaded into a hopper. From the hopper, the bulk waste is fed at a controlled rate onto a conveyor belt which carries it to a magnetic separator where ferrous metals are removed and then to a sorting operation where trash and slag pieces are hand picked and removed. From these operations, the belt feeds the sorted waste into a ball mill where the large chunks of batteries are broken up and a liquid (part water-part battery acid) is added to slurry the material through the rest of the separation process. From the ball mill, the slurry enters the Cal West Separator, a patented inclined rotating drum with specifically designed internal baffles and vanes to facilitate the movement of the less dense plastic and hard rubber fractions forward through the drum. The lead oxide and lead metal settle to the rear during this process and is removed at the rear where the lead oxide slurry is washed off the metal and are applied to an endless belt vacuum filter. There, water is removed and the oxide is collected. The metal falls into a barrel.

The less dense fraction (plastic and hard rubber) leaves the rotating drum as a slurry enters a settling chamber where the plastic floats to the surface where it is removed. The hard rubber sinks to the bottom and is removed. The liquid from the system is then recycled as the incoming slurry liquid. Each rotating drum separator has the capacity to process up to 10 tons of waste per hour. The usual recovery rate is 30% by weight of lead oxide and 3-5% metallic lead; the remainder is plastic and hard rubber.

* Patent attached as Appendix A

## System Evaluation

During a site visit on June 29, 1983, Dr. Joseph P. Lafornara, EPA Environmental Response Team, toured the St. Louis Lead facility, inspected the device, and observed and documented its operation on video tape. The results were impressive. The entire system operated flawlessly. The system feed, the separator, and the lead, lead oxide, plastic, and hard rubber handling sub-systems functioned well. The evaluators were particularly impressed with the fact that no dust or fumes were produced by the process despite the hot, dry weather conditions and with the extreme attention given to employee safety in the operation (respiratory protection was required and hot side/cold side personnel decontamination procedures were in practice.)

Prior to the site visit, contacts were made with Mr. Richard Ida, of the EPA National Enforcement Investigation Center (NEIC) in Denver regarding his evaluation of the system, which was performed in January 1983. His evaluation was positive and he stated that he was impressed with the system and that it worked well while he was there. Mr. Ida did say, however, that the recovered hard rubber leached a significant amount of lead during EPA toxicity testing. To correct this condition, St. Louis Lead is installing a second rinse tank for the hard rubber where it will be coated with Lead-Loc, a proprietary material which should tie up any leachable lead.

## Applicability of Techniques

Based on the results to date of the operation at Granite City, it is safe to say that an on-site cleanup capabilty now exists for eliminating the piles of previously recycled batteries at uncontrolled hazardous waste sites such as bankrupt or abandoned secondary smelters or large junk yards. The use of this system at these sites could significantly reduce the introduction of additional lead pollution into nearby communities. It is, therefore, recommended that information on this process be made available to the Headquarters Emergency Response Division, Hazardous Sites Control Division, Regional Air Pollution Control and Superfund Personnel, Field Investigation Team Contractors, and the Technical Assistance Team Contractor so that the system may be given due consideration during the design phase of superfund removal and remedial efforts. It is further recommended that the Office of Solid Waste Enforcement be made aware of the system so that it can be given due consideration during negotiations and litigation with the responsible parties at sites with lead pollution problems.